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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/334,646 | 06/17/1999 | SHUNPEI YAMAZAKI | 0756-1984 | 5565 |
| 31780 | 7590 | 11/18/2004 | EXAMINER | |
| ERIC ROBINSON PMB 955 21010 SOUTHBANK ST. POTOMAC FALLS, VA 20165 | | | HU, SHOUXIANG | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2811 | |

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/334,646

Applicant(s)

YAMAZAKI ET AL.

Examiner

Shouxiang Hu

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8, 11-14, 16-19, 32-34, 38-43, 52, 53, 58-60, 65, 71-73, 75, 78-81, 100-103 and 122-145 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 08/513,090.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20040826 & 20040115 R 20040409
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 1-3,8,11-14,16-19,32-34,38-43,52,53,58-60,65,71-73,75,78-81,100-103 and 122-145.

DETAILED ACTION

Claim Objections

1. Claims 1-3, 8, 11-14, 16-19, 32-34, 38-43, 52, 53, 58-60, 65, 71-73, 75, 78-81, 100-103 and 122-145 are objected to because of the following informalities and/or defects:

Claims 1-3, 122, 128, 134 and 140 each recite or implicate the subject matters that the channel-forming regions of the recited two transistors are in two separated semiconductor layers. However, among various possible interpretations, such limitations may be interpreted as meaning: the two transistor for formed of two different semiconductor layers (on different levels), even though they may both be formed on a same insulating surface, as the word of "on" may not necessarily have the meaning of: "above and in direct contact with". It would then be unreadable on the specification and the drawings (see Fig. 3) of the instant disclosure, since the channel regions of the two transistors therein are formed of two separated regions of a same semiconductor layer.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

Art Unit: 2811

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1-2, 11-14, 16, 71-72, 78-79, 122-125, 127-131, 133-137, 139-143 and 145, as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 102(e) as being anticipated by Kato (US 5,589,506; of record).

Kato discloses an active matrix type LC display device having a buffer circuit in the drive circuit (Figs. 1-13, esp. Figs. 7 and 12; also see col. 13, lines 5-50), comprising: a first TFT (the middle one of 10D1(i)) and second TFT (the lower one of 10D1(i)), wherein the two TFTs share a common gate electrode, a common source electrode and a common drain electrode, and the two channel forming regions of the two TFTs are formed in separated regions of a Si layer that is naturally on a same insulating surface.

In addition, it is noted that an active matrix type LC device such as the one of Kato naturally further comprises a memory and a decode. And the channel-forming regions in the thin Si film therein naturally have point defects.

Art Unit: 2811

Regarding claims 124, 130, 136 and 142, the common gate, source and drain electrodes for the two TFTs in Kato are all extended in parallel with each other along the vertical direction (see Fig. 12).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 8, 17-19, 32-34, 38-43, 52, 53, 58-60, 65, 73, 75, 80-81, 100-103, 126, 132, 138 and 144, as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Zhang (US 5,403,772; of record).

The disclosure of Kato is discussed as applied to claims 1-2, 11-14, 16, 71-72, 78-79, 122-125, 127-131, 133-137, 139-143 and 145 above.

Although Kato does not expressly disclose that the silicon semiconductor layer can be monocrystalline, one of ordinary skill in the art would readily recognize that monocrystalline silicon can be desirably formed for improving the performance of the TFTs, as evidenced in Zhang as explained below.

Zhang teaches to form an active matrix type LC display device (Figs. 1-8A, particularly, Fig. 8A), comprising: a pixel matrix portion (104) having a plurality of pixels on an insulating substrate (107); and a peripheral driver circuit portion (101 and 102) on

Art Unit: 2811

the same insulation substrate, thin film transistors (TFTs) in the driver circuit portion each having a channel forming region in one of the separate semiconductor layers (11a and 11b) provided on an insulating surface, wherein the channel forming region is provided in a region which can be regarded as effectively monocrystalline silicon (see col. 6, lines 13-15); and, the channel forming region contains impurities (a type of point defects) of carbon, nitrogen and oxygen at a concentration less than 10^{18} cm^{-3} , which meets the limitation of each channel forming region "containing carbon and nitrogen at a concentration of $5 \times 10^{18} \text{ cm}^{-3}$ or less, respectively, and containing oxygen at a concentration of $5 \times 10^{19} \text{ cm}^{-3}$ or less" recited in the claimed invention. It is noted that, since the channel forming region in Zhang is formed with a method which is substantially the same as the one used in the claimed invention, the method used in Zhang is regarded as being inherently capable of forming the channel forming region having no linear defects or surface defects. In addition, one of ordinary skill in the art would readily recognize that it is always desirable to form the channel forming region having no linear defects or surface defects for achieving good channel performance.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the monocrystalline silicon layer of Zhang into the TFT device of Kato, so that an active matrix type LC display with better TFT performance therein would be obtained.

Art Unit: 2811

Response to Arguments

6. Applicant's arguments with respect to the rejected claims above have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

November 10, 2004



**SHOUXIANG HU
PRIMARY EXAMINER**